



European Nuclear Isotope Evaluation, Selection and Feasibility Study

On deep space missions that extend beyond Jupiter photovoltaic cells cannot rely on harnessing the external power of the sun and electrochemical processes are too low in energy density to provide useful sustained power. Nuclear processes however can have huge energy densities and thus are a key enabling technology.

SEA was contracted by the European Space Agency (ESA) to evaluate the various radioisotopes having potential use in space nuclear power systems, both Radioisotope Heater Units (RHUs) and Radioisotope Power Systems (RPSs) paying particular regard to the feasibility and cost of production/separation within the ESA member states.

SEA teamed with the University of Manchester Dalton Nuclear Institute and the National Nuclear Laboratory (NNL) to complete this work.

Study areas were:

- technical performance
- feasibility of production/separation within member ESA states
- trade off analysis
- recommendation of best isotopes
- cost and timescale of production or separation for the selected radionuclides within ESA member states estimated by a detailed and fully justified approach
- regulatory aspects

Part of the very detailed report

